

I claim:

1 1. A device for transplanting donor corneal tissue onto a mammalian recipient's eye,
2 comprising:

3 (a) a cutting blade; wherein the dimensions and shape of said cutting blade are adapted
4 to allow said cutting blade to cut a cornea button suitable for transplantation from the donor corneal
5 tissue;

6 (b) a removable, concave base plate comprising a proximal end having a plurality of
7 suction ports, and a distal end having a plurality of suture grooves; wherein said suction ports are
8 adapted to receive and distribute a negative pressure to hold the donor corneal tissue; and wherein
9 said suture grooves have a size and shape adapted to guide a suture needle into the cornea button and
10 through surrounding corneal tissue when the cornea button is placed on the recipient's eye;

11 (c) a concave support block having a bore adapted to receive said base plate; wherein said
12 block is adapted, so that when said base plate is positioned in said bore, said support block and said
13 base plate form a smooth and continuous concave surface that approximates the curvature of the
14 anterior surface of the corneal tissue; and

15 (d) a vacuum device adapted to supply a negative pressure to the cornea button to hold
16 the cornea button on said base plate;

17 wherein:

18 (e) when negative pressure is applied to the donor corneal tissue, a cornea button may
19 be cut from the donor corneal tissue, placed onto to the recipient's eye, and sutured to the remaining
20 corneal tissue of the recipient.

1 2. A device as recited in Claim 1, additionally comprising a handle attached to said base plate.

1 3. A device as recited in Claim 2, wherein said handle is a syringe-type suction device.

1 4. A device as recited in Claim 1, wherein the size of said cutting blade is adapted to cut the
2 donor corneal tissue to a size that is slightly larger than said base plate.

1 5. A device as recited in Claim 1, wherein the size of said cutting blade is adapted to cut the
2 donor corneal tissue to a size that is slightly smaller than said base plate.

1 6. A device as recited in Claim 1, additionally comprising a lid to hold said cutting blade,
2 wherein said lid further comprises a plurality of inserts positioned at each corner; and wherein said
3 support block further comprises ports located at the periphery of said support block; wherein said
4 ports are adapted to receive said inserts to align the position of said lid in said support block.

1 7. A device as recited in Claim 1, wherein said suture grooves are adapted to allow a suture
2 needle to pass through the distal end of said removable, concave base plate as the suture needle is
3 passed through the cornea button and surrounding recipient corneal tissue.

1 8. A method for surgically promoting grafting between a healthy donor cornea button and a
2 mammalian recipient's remaining corneal tissue using a device as recited in Claim 1; said method
3 comprising holding the donor corneal tissue to the removable, concave base plate with negative
4 pressure from the vacuum device; cutting a cornea button from the donor corneal tissue; placing the
5 cornea button onto the recipient's eye, while maintaining negative pressure; and suturing the cornea
6 button to the recipient's corneal tissue by suturing through the suture grooves.

1 9. A method as recited in Claim 8, wherein the diameter of the cornea button is slightly larger
2 than the portion of the cornea removed from the recipient.

1 10. A method as recited in Claim 8, additionally comprising the steps of detaching the base plate
2 from the support block, and positioning the base plate near the recipient's eye, while maintaining
3 negative pressure on the cornea button, so that the cornea button fills the void created where a
4 portion of the cornea was removed from the recipient's eye.

1 11. A method as recited in Claim 8, additionally comprising the steps of inserting a suture needle
2 into a suture groove, and passing the suture needle and suture into the cornea button and through the
3 surrounding corneal tissue.

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1 12. A method as recited in Claim 11, wherein the suture is a running suture.

1 13. A method as recited in Claim 11, additionally comprising the steps of passing the suture
2 through the suture groove slit, and repeating the steps of Claim 11 until sutures have been passed
3 through all of the suture grooves.